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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,430	06/02/2006	Masuaki Okada	YANE-0002-US1	3646

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EXAMINER	
DANG, TRUNG Q	

ART UNIT	PAPER NUMBER
2892	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,430	OKADA, MASUAKI	
	Examiner	Art Unit	
	Trung Dang	2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) *19-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-12,17 and 18* is/are rejected.

7)☒ Claim(s) *5 and 13-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/02/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election of the Group I invention, claims 1-18 in the reply filed on 02/19/08 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 6, 10 ,12, and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Katada et al. (US 5,383,993).

With reference to Figs. 2(a)-2(c) and TABLE 1, the prior art teaches the claimed invention in that it discloses a bonding method comprises:

subjecting bonding surfaces of a first and second semiconductor substrate to an activation treatment using oxygen plasma thereby rendering said surfaces hydrophilic (col. 2, lines 40-46; col. 4, lines 3-34, and TABLE 1);

thereafter performing anodic bonding said first and second semiconductor substrate (Fig. 2(c) and col. 6, lines 17-35 that are considered with the disclosure in TABLE 1 in which the surfaces of the first and second substrate are treated with oxygen plasma).

For claim 2, see Fig. 1(c), Fig. 2(c) and related text.

For claim 6, see col. 4, lines 45-46 for the preliminary bonding taking place in a clean room (i.e., room temperature), and Fig. 2(c) for the main anodic bonding that is performed in a separate step or device.

For claim 17, see TABLE 1.

For claim 18, the pressure sensor of Fig. 3(a) is a MEMS device.

4. Claims 1, 2, 6-8, 10, 12, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang (US 2005/0101059).

The prior art teaches the claimed invention in that it discloses a bonding method which comprises performing anodic bonding of objects to be bonded after subjecting bonding surfaces of both the objects to be bonded to a surface activation treatment using an energy wave, such as an atom beam, an ion beam, or a plasma (see para. [0039] and claim 9). Note that Yang's process includes a plasma activated bonding (corresponding to the claimed preliminary bonding) and an anodic bonding as disclosed in claim 9.

For claim 2, the preliminary bonding is performed at room temperature, hence the claimed limitation "both the objects to be bonded are heated at less than 400 ^{o}C during bonding" is met.

For claim 6, the anodic bonding step is a separate step from the plasma activated bonding.

For claim 7, Fig. 3c shows a single transparent member 354 is aligned and bonded to a substrate containing a plurality of MEMS devices, hence a single placement of the transparent member 354 on the substrate (i.e., a single preliminary bonding) results in a plurality of anodic bonding steps corresponding to each MEMS device.

For claim 8, para. [0032] discloses that AR coating may be applied to the top surface of the transparent member. Thus, when the transparent member is bonded to the substrate, the AR coating layer is interposed between the substrate and the transparent member. Since the material of the AR coating is different from the materials of the substrate and the transparent member, the coefficient of linear expansion of the AR coating is different from that of the substrate and the transparent member.

For claim 18, see para. [0022] for the semiconductor device is a MEMS device.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 3, 4, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang as above in view of Farrens et al. (US 6,645,828).

Yang teaches an anodic bonding process as described above. Yang differs from the claims in not disclosing that the surface activation treatment and the anodic bonding is performed without exposure to the atmospheric air.

Farrens teaches an in situ surface activation with oxygen plasma followed by a bonding process without breaking vacuum or exposing the materials to external environments (col. 5, lines 20-35).

It would have been obvious to one of ordinary skill in the art to modify Yang's teaching by performing the oxygen plasma activation treatment and the bonding in the same chamber (in situ) without breaking vacuum because the in situ bonding eliminates contaminations from absorbing on the surfaces and becoming trapped at the bonding interface.

7. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang as above in view of Katada et al cited above.

Yang teaches an anodic bonding process as described above. Although Yang discloses the plasma activated bonding (preliminary bonding) is performed in a low-pressure chamber under a low pressure (i.e., 35 mTorr in para. [0039]), Yang is silent as to the anodic bonding is performed in the atmosphere air using separate device.

In the same field of endeavor, Katada teaches a bonding process in which anodic bonding is performed in the atmospheric air using separate device including power source 42 (Fig. 2c).

It would have been obvious to one of ordinary skill in the art to modify Yang's teaching by performing the anodic bonding in the atmospheric air using a separate device as suggested by Katada because such bonding ambient carried out by anodic bonding is known, and the application of a know technique to make the same would have been within the level of one skilled in the art.

Allowable Subject Matter

8. Claims 5, 13-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Dang whose telephone number is 571-272-1857. The examiner can normally be reached on Mon-Friday 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on 571-272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Trung Dang/
Primary Examiner, Art Unit 2892

3/17/08